

Mission Incident  
Santa Paula, CA  
Preliminary Summary of Air Monitoring Results  
December 10, 2014

Prepared by  
Center for Toxicology and Environmental Health, L.L.C. (CTEH®)  
Project Managers: Kyle Lawrence & Jacob Fenske

## Introduction

Center for Toxicology and Environmental Health, LLC (CTEH®) continued air monitoring in support of response activities following a vac truck explosion and fire in Santa Paula, CA.

This submittal summarizes air monitoring data for December 10, 2014 07:00 to December 11, 2014 07:00.

## Real-time Air Monitoring

All instrumentation was calibrated at least once per day or per manufacturer's recommendations. Manually-logged real-time air monitoring was conducted for chlorine ( $\text{Cl}_2$ ), hydrogen sulfide ( $\text{H}_2\text{S}$ ), hydrochloric acid ( $\text{HCl}$ ), percent of the Lower Explosive Limit (LEL), oxygen ( $\text{O}_2$ ), peroxides, particulate matter (10 micron particles,  $\text{PM}_{10}$ ), sulfur dioxide ( $\text{SO}_2$ ), sulfuric acid ( $\text{H}_2\text{SO}_4$ ), and volatile organic compounds (VOCs), with instruments such as Gastec® pumps with chemical-specific colorimetric tubes, RAESystems® MultiRAE Plus and MultiRAE Pro PID with chemical-specific sensors, and TSI® AM510s for particulate matter. Monitoring was conducted by CTEH® personnel in the work area, at fixed locations in the surrounding community, and along the perimeter of the facility in the community. Table 1 summarizes monitoring data for manually-logged real-time readings. Maps including the site location, fixed community real-time air monitoring locations, aerial site photo, and roaming monitoring are included in Appendix A.

CTEH® monitored RAESystems® AreaRAE units with ProRAE Guardian system at four locations on the fence line of the facility within the work area and an additional unit near frac tanks near a designated decon area. AreaRAEs were equipped with sensors to detect VOCs, LEL,  $\text{H}_2\text{S}$ , and  $\text{SO}_2$ . Table 2 summarizes monitoring data for AreaRAE monitoring. AreaRAE graphs displaying real-time air monitoring data as well as 15-minute rolling averages and a map depicting AreaRAE locations are included in Appendix B.

Particulate monitors were data-logged along the facility perimeter collocated with AreaRAE stations 1, 2, 3, and 4. Table 3 summarizes data-logged  $\text{PM}_{10}$  data from these units.

Table 1: Manually-Logged Real-Time Air Monitoring Summary<sup>1</sup>  
December 10, 2014 07:00 – December 11, 2014 07:00

Location Category	Analyte	Instrument	No. of Readings	No. of Detections	Avg. of Detections	Detection Range
Community	Cl <sub>2</sub>	Gastec 8La	6	0	NA	<0.05 ppm
	H <sub>2</sub> S	MR+ / MR Pro	31	0	NA	<0.1 ppm
	HCl	Gastec 14L	6	0	NA	<0.05 ppm
	LEL	MR+ / MR Pro	31	0	NA	<1 %
	O <sub>2</sub>	MR+ / MR Pro	31	31	20.9	20.9 - 20.9 %
	Peroxides	Gastec 32	6	0	NA	<0.1 ppm
	PM <sub>10</sub>	AM510/Dusttrak	27	27	0.022	0.014 - 0.033 mg/m <sup>3</sup>
	SO <sub>2</sub>	MR+ / MR Pro	27	0	NA	<0.1 ppm
	H <sub>2</sub> SO <sub>4</sub>	Gastec 35	6	0	NA	<0.2 mg/m <sup>3</sup>
	VOC	MR+ / MR Pro	32	0	NA	<0.1 ppm
Exclusion Zone	Cl <sub>2</sub>	Gastec 8La	1	0	NA	<0.05 ppm
	H <sub>2</sub> S	MR+ / MR Pro	11	0	NA	<0.1 ppm
	HCl	Gastec 14L	1	0	NA	<0.05 ppm
	LEL	MR+ / MR Pro	11	0	NA	<1 %
	O <sub>2</sub>	MR+ / MR Pro	6	6	20.9	20.9 - 20.9 %
	Peroxides	Gastec 32	1	0	NA	<0.1 ppm
	SO <sub>2</sub>	MR+ / MR Pro	11	0	NA	<0.1 ppm
	H <sub>2</sub> SO <sub>4</sub>	Gastec 35	1	0	NA	<0.2 mg/m <sup>3</sup>
	VOC	MR+ / MR Pro	11	0	NA	<0.1 ppm
Work Area	Cl <sub>2</sub>	Gastec 8La	4	0	NA	<0.05 ppm
	H <sub>2</sub> S	Gastec 4LL	1	0	NA	<0.1 ppm
		MR+ / MR Pro	22	0	NA	<0.1 ppm
	HCl	Gastec 14L	3	0	NA	<0.05 ppm
	LEL	MR+ / MR Pro	23	0	NA	<1 %
	O <sub>2</sub>	MR+ / MR Pro	23	23	20.9	20.9 - 20.9 %
	Peroxides	Gastec 32	4	0	NA	<0.1 ppm
	PM <sub>10</sub>	AM510/Dusttrak	2	2	0.009	0.008 - 0.009 mg/m <sup>3</sup>
	SO <sub>2</sub>	Gastec 5Lb	1	0	NA	<0.1 ppm
		MR+ / MR Pro	13	0	NA	<0.1 ppm
	H <sub>2</sub> SO <sub>4</sub>	Gastec 35	3	0	NA	<0.2 mg/m <sup>3</sup>
	VOC	MR+ / MR Pro	23	0	NA	<0.1 ppm

<sup>1</sup>Note: The data set displayed here has not undergone complete QA/QC analysis and is presented in a preliminary format.

<sup>2</sup>Maximum detections preceded by the "<" symbol are considered non-detects below reporting limit to the right.

Table 2: AreaRAE Air Monitoring Summary<sup>1</sup>  
December 10, 2014 07:00 – December 11, 2014 07:00

Unit ID	Analyte	No. of Readings	No. of Detections	Avg. of Detections	Detection Range <sup>2</sup>
Unit 01	H <sub>2</sub> S	5663	145	0.2 ppm	0.1 - 0.4 ppm
	LEL	5663	0	NA	< 1 %
	SO <sub>2</sub>	5663	40	0.1 ppm	0.1 - 0.1 ppm
	VOC	5663	0	NA	< 0.1 ppm
Unit 02	H <sub>2</sub> S	5636	319	0.1 ppm	0.1 - 1.0 ppm
	LEL	5636	0	NA	< 1 %
	SO <sub>2</sub>	5636	0	NA	< 0.1 ppm
	VOC	5636	111	0.1 ppm	0.1 - 0.2 ppm
Unit 03	H <sub>2</sub> S	5620	231	0.1 ppm	0.1 - 0.2 ppm
	LEL	5620	0	NA	< 1 %
	SO <sub>2</sub>	5620	0	NA	< 0.1 ppm
	VOC	5620	12	0.1 ppm	0.1 - 0.1 ppm
Unit 04	H <sub>2</sub> S	5653	49	0.1 ppm	0.1 - 0.1 ppm
	LEL	5653	0	NA	< 1 %
	SO <sub>2</sub>	5653	0	NA	< 0.1 ppm
	VOC	5653	0	NA	< 0.1 ppm
Unit 06	H <sub>2</sub> S	1834	11	0.1 ppm	0.1 - 0.3 ppm
	LEL	1834	0	NA	< 1 %
	SO <sub>2</sub>	1834	0	NA	< 0.1 ppm
	VOC	1834	431	0.1 ppm	0.1 - 0.2 ppm

<sup>1</sup>Note: The data set displayed here has not undergone complete QA/QC analysis and is presented in a preliminary format.

<sup>2</sup>Maximum detections preceded by the "<" symbol are considered non-detects below reporting limit to the right.

Table 3: AM510 PM<sub>10</sub> Monitoring Summary<sup>1</sup>  
December 10, 2014 07:00 – December 11, 2014 07:00

Serial No.	Location	No. of Readings	No. of Detections	Avg. Detection	Detection Range
<b>10601072</b>	AR01	4522	4522	0.02	0.005 - 0.223 mg/m <sup>3</sup>
<b>10408087</b>	AR02	6099	6099	0.043	0.005 - 0.936 mg/m <sup>3</sup>
<b>10704074</b>	AR03	5156	5156	0.023	0.006 - 0.733 mg/m <sup>3</sup>
<b>10704075</b>	AR03	6510	6502	0.007	0.001 - 0.18 mg/m <sup>3</sup>
<b>10704072</b>	AR04	5998	5987	0.014	0.001 - 0.116 mg/m <sup>3</sup>

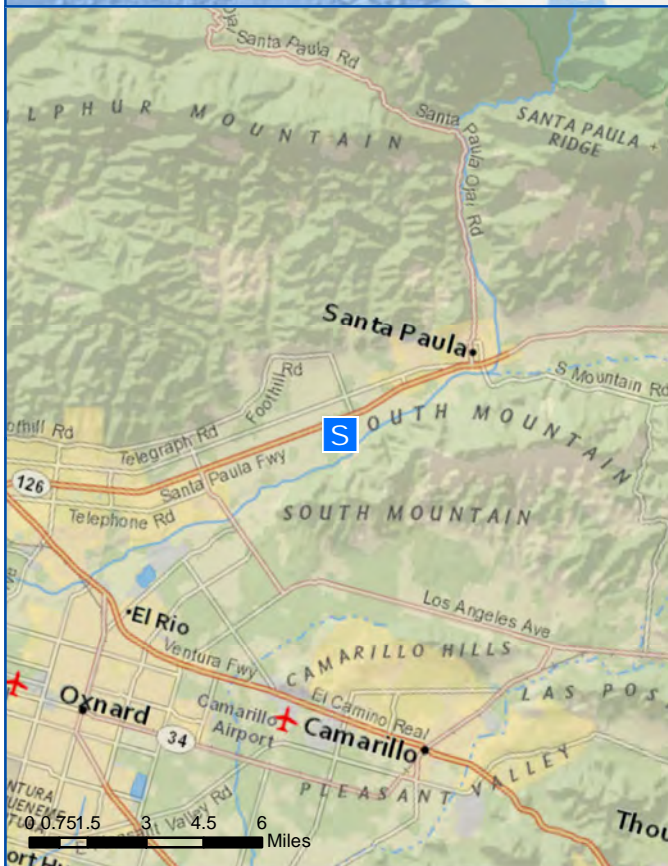
<sup>1</sup>Note: The data set displayed here has not undergone complete QA/QC analysis and is presented in a preliminary format.

# Appendix A

## Incident Maps:

### Real-time Air Monitoring Locations and Incident Site





**Legend**  
 Site Location



0 50 100  
Feet





0 250 500 1,000  
Feet



## Legend

- FRT Location
- Site Location





## Legend

### Monitoring Location

- Non-detect (< 0.1 ppm)
- S Incident Site

0 0.125 0.25 0.5 Miles





## Legend

### Monitoring Location

- Non-detect (< 0.2 mg/m<sup>3</sup>)
- S Incident Site

0 0.125 0.25 0.5 Miles













## Legend

### Monitoring Location

- Non-detect (< 0.1 ppm)
- S Incident Site

0 0.125 0.25 0.5 Miles





## Legend

### Monitoring Location

- Detect (20.9 %)
- S Incident Site

0 0.125 0.25 0.5 Miles





## Legend

### Monitoring Location

- Non-detect (< 1 %)
- S Incident Site









## Legend

### Monitoring Location

- Non-detect (< 1 ppm)
- S Incident Site

0 0.125 0.25 0.5 Miles







Appendix B:

AreaRAE Trend Graphs, AM510  
Trend Graphs, and  
AreaRAE/AM510 Air Monitoring  
Location Map



0 50 100 Feet



AR01

AR02

AR04

AR06

AR03

Legend



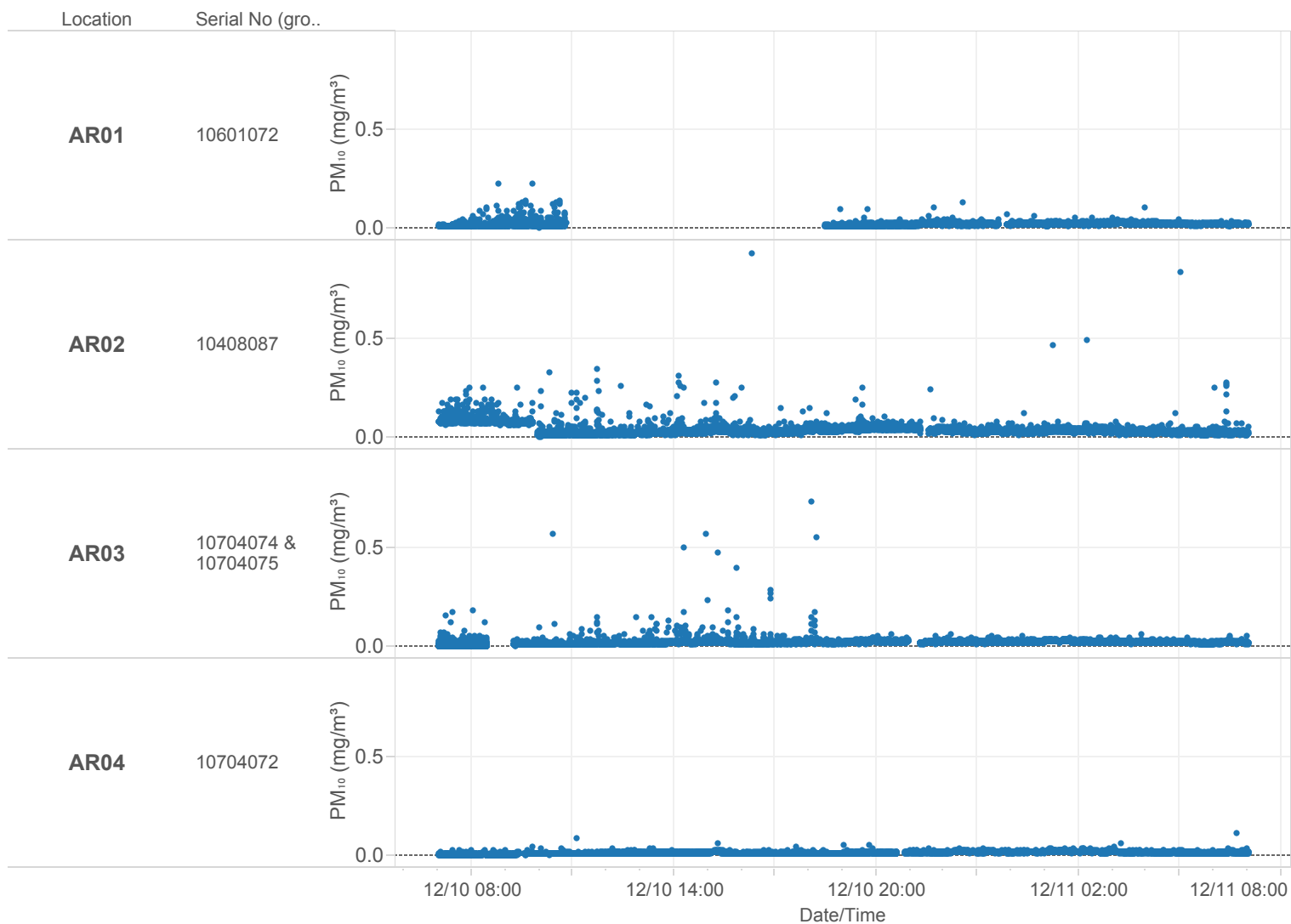
AreaRAE & AM510 Station



AreaRAE Station



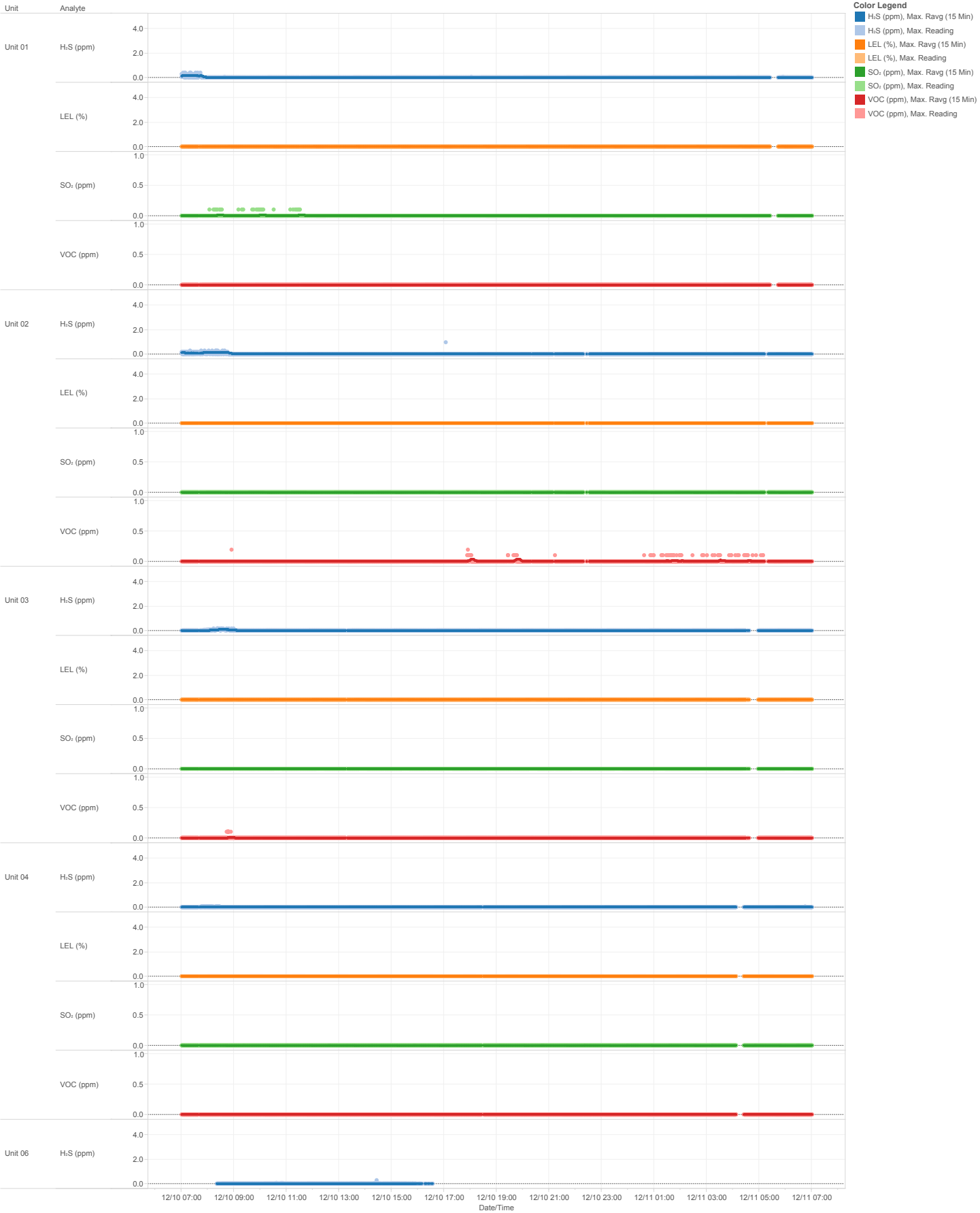
Patriot Environmental  
MISSION INCIDENT  
Datalogged AM510 (PM<sub>10</sub>) Summary  
12/10/2014 07:00 - 12/11/2014 07:00



- The data set displayed here has not undergone complete QA/QC analysis and is presented in a preliminary format



Patriot Environmental  
AreaRAE Trend Graphs  
12/10/2014 07:00 - 12/11/2014 07:00

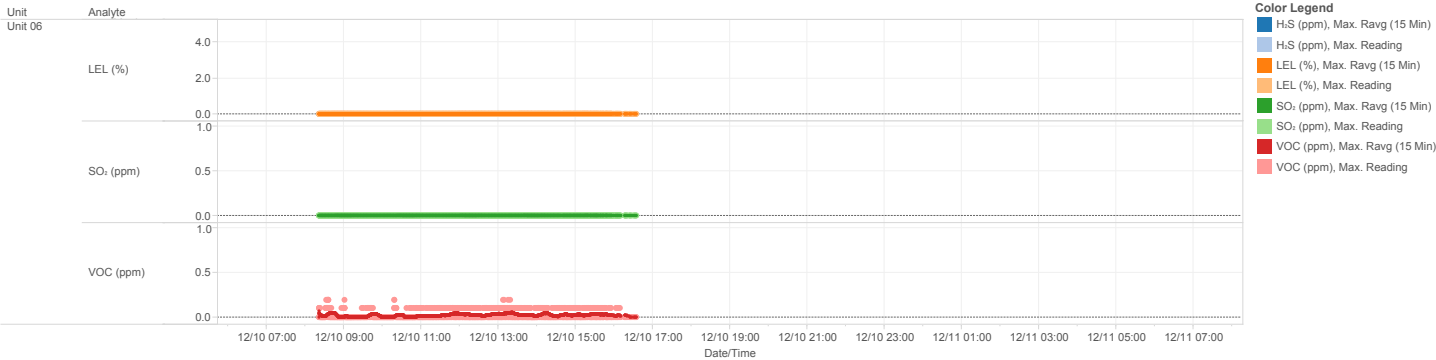


- The data set displayed here has not undergone complete QA/QC analysis and is presented in a preliminary format

- AreaRAE data may contain "drift events." Drift is defined as interference in the electrochemical sensor's ability to accurately report the concentration of a chemical in the atmosphere, resulting in "false positives"



Patriot Environmental  
AreaRAE Trend Graphs  
12/10/2014 07:00 - 12/11/2014 07:00



- The data set displayed here has not undergone complete QA/QC analysis and is presented in a preliminary format.  
- AreaRAE data may contain "drift events." Drift is defined as interference in the electrochemical sensor's ability to accurately report the concentration of a chemical in the atmosphere, resulting in "false positives"